

Phase Shifting Applications of Universal Frequency Translation

Abstract

A universal frequency translation module (UFT) frequency translates an electromagnetic (EM) input signal by sampling the EM input signal according to a periodic control signal (also called an aliasing signal). By controlling the relative sampling time, the UFT module implements a relative phase shift during frequency translation. In other words, a relative phase shift can be introduced in the output signal by sampling the input signal at one point in time relative to another point in time. As such, the UFT module can be configured as an integrated frequency translator and phase-shifter. This includes the UFT module as an integrated down-converter and phase shifter, and the UFT module as an integrated up-converter and phase shifter. Applications of universal frequency translation and phase shifting include phased array antennas that utilize integrated frequency translation and phase shifting technology to steer the one or more main beams of the phased array antenna.

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